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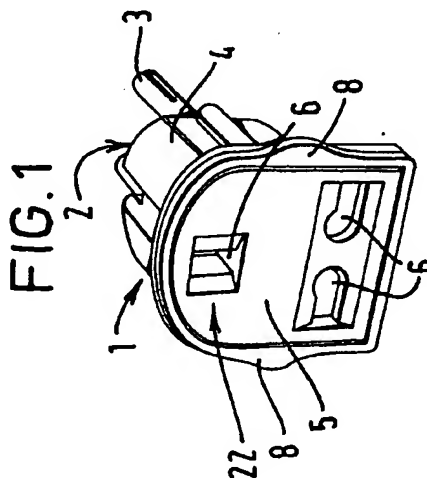
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(54) **Electrical connector.**

(57) An electrical connector having a hollow electrically insulating body (1), one end (2) of which carries a set of male electrical contact members (3), the body (1) having first (4) and second (5) body parts which together define the body, one of which parts defines the said one end (2) of the body and the other of which parts defines the other end (22) of the body, characterised in that the said one body part (4) is formed with an opening or recess (17) communicating with the hollow interior of the body, and in that said other body part (5) is adapted for reception within the recess or opening.



The invention relates to an electrical connector. More specifically, but not exclusively, the invention relates to an electrical connector of the kind used by international travellers to enable the connection of electrical appliances conforming to one standard of plug configuration to electrical outlets or sockets formed to receive plugs conforming to a different standard.

It is an object of the invention to provide an electrical connector which can be made and assembled simply with the minimum of hand labour. It is a particular object of the invention to provide a connector which requires no fixing screws or the like in its assembly.

According to the invention, an electrical connector comprises a hollow electrically insulating body, one end of which carries a set of male electrical connecting members, the body having first and second body parts which together define the body, one of which parts defines the said one end of the body and the other of which parts defines the other end of the body, the said one body part being formed with an opening communicating with the hollow interior of the body, and said other body part being adapted for reception within the opening. A result of this construction is that the forces imposed on the body on inserting or removing the connector from a wall socket or the like do not tend to pull the connector apart as is usual with conventional connectors, e.g. so-called mains plugs since the hand will grasp and apply force to the part of the body carrying the male connecting members. For this reason it is possible to join the two body parts together without the need for screws. Preferably the arrangement is such that the other body part is wholly received within the opening in the one body part so that the external surface of the other body part is flush with the surface of the portion of the one body part which defines the opening.

The other body part may be formed with a socket array arranged to receive a corresponding set of male electrical connecting members. Preferably the hollow body contains electrical conductors connecting the set of male electrical connecting members carried by the one body part to the socket array, the conductors being trapped between the two body parts whereby the conductors are located in position.

Preferably the two body parts are connected together by integral snap action connectors which may be formed on the other body part to locate in recesses in the one body part. Preferably the two body parts also have members arranged to engage frictionally one with the other to resist dis-assembly of the body. These frictional coupling members may comprise a spigot on one of the body parts arranged for engagement in a socket in the other body part. The spigot and socket connectors may also be used to locate the electrical conductors in place in the body. Thus the conductors may be pierced with holes in which the

spigot and socket connectors are received.

The invention is diagrammatically illustrated by way of example in the accompanying drawings in which:-

- 5 Figure 1 is a perspective view of an electrical connector taken from said "other" end;
- Figure 2 is a perspective view of the front of the "other" body part;
- Figure 3 is a perspective view of the "one" body part and showing its interior;
- 10 Figure 4 is a perspective view of a set of internal electrical conductors and attached male and female connecting members to a European standard;
- Figure 5 is a perspective view of a shutter door and spring for use in blanking off the socket array;
- Figure 6 is a scrap cross-sectional view of a detail of the interior arrangement of the electrical connector of Figures 1 to 5;
- 20 Figure 7 is a perspective view showing the interior of the "other" body part;
- Figure 8 is a perspective view corresponding to that of Figure 7 and showing the shutter door mechanism in place;
- 25 Figure 9 is a perspective view showing the front of the said "one" body part, and
- Figures 10 and 11 are perspective views corresponding to those of Figures 5 and 4 respectively and taken from a diametrically opposite perspective.

It will be noted that Figures 2 to 5 and 7, 9, 10 and 11 are respective exploded views of the electrical connector taken from diametrically opposed perspectives. In the drawings an electrical connector is shown in the form of a so-called travel adaptor to enable the connection of electrical appliances conforming to one standard of plug configuration to electrical outlets or sockets formed to receive plugs conforming to a different standard. The connector comprises a hollow electrically insulating body 1, e.g. moulded from plastics, one end 2 of which carries a set of male electrical contact members 3 in the form of brass pins. The body 1 comprises a first hollow body part 4 which defines the said one end 2 of the connector and a second body part 5 which defines the opposite or other end 22 of the connector. The body part 5 is formed with a socket array 6 for receiving the connecting contact pins of an electrical plug (not shown) the arrangement being that the pins 3 conform to one electrical standard whereas the socket array 6 conforms to a different electrical standard. Internally the socket array 6 is provided with female electrical contact members 21 which are connected to the respective members of the set of pins 3 by electrical conductors 7 as shown in Figures 4 and 11 and more fully described below.

The body part 4 is formed with a recess 17 which opens into the hollow interior of the body, the recess 17 being arranged snugly to contain the body part 5

so that the external face of the body part 5 lies flush with the surface of the body part 4 defining the recess 17, and closes the hollow interior of the body. Thus when in position as shown in Figure 1 of the drawings the body part 5 is surrounded by the body part 4 which is formed with an opposed pair of flanges 8 adapted to be grasped by the user when inserting or removing the connector e.g. from a wall socket.

The body part 5 is formed with a series of snap-action connectors 9 which are adapted to engage in corresponding recesses 10 in the body part 4 to hold the two body parts together. In addition the body part 5 is formed with three projecting bosses 11 formed with sockets 12 adapted to receive corresponding projecting pins or spigots 23 formed in the interior of the body part 4, see Figure 6. The spigots and sockets are dimensioned to engage frictionally on assembly of the two body parts to resist subsequent dis-assembly of the body parts.

The interior of the body part 4 is formed with partitions 13 which divide the interior of the hollow body into three electrically separate chambers 20 to assure electrical isolation between the conductors 7 which are located one in each of the separate chambers, with their associated pins 3 projecting through apertures 15 in the end 2 of the body part 4. The electrical conductors 7 are further located in position by forming them with apertures 14 which are engaged by the pins or spigots 23 in the body part 4 and in addition the bosses 11 are dimensioned to trap the conductors 7 against the body part 4 so that the conductors are located firmly in position, see Figure 6.

It will be appreciated that although the invention has been specifically described with reference to a so-called travel adaptor it is equally applicable to other electrical connectors such as mains plugs and the like.

Claims

1. An electrical connector having a hollow electrically insulating body (1), one end (2) of which carries a set of male electrical contact members (3), the body (1) having first (4) and second (5) body parts which together define the body, one of which parts defines the said one end (2) of the body and the other of which parts defines the other end (22) of the body, characterised in that the said one body part (4) is formed with an opening or recess (17) communicating with the hollow interior of the body, and in that said other body part (5) is adapted for reception within the recess or opening.
2. An electrical connector according to claim 1, characterised in that the other body part (5) is substantially wholly received within the opening

or recess (22) in the one body part (4) so that the external surface of the other body part (5) is flush with the surface of the portion of the one body part (4) which defines the opening or recess.

3. An electrical connector according to claim 1 or claim 2, characterised in that the other body part (22) is formed with a socket array (6) arranged to receive a corresponding set of male electrical connecting members.
4. An electrical connector according to any one of claims 1 to 3, characterised in that the hollow body (1) contains electrical conductors (7) connecting the set of male electrical connecting members (3) carried by the one body part (4) to the socket array (6), the conductors (7) being trapped between the two body parts (4,5) whereby the conductors are located in position.
5. An electrical connector according to any preceding claim, characterised in that the two body parts (4,5) are connected together by integral snap action connectors (9,10).
6. An electrical connector according to any preceding claim, characterised in that the two body parts (4,5) have members (11,23) arranged to interengage frictionally to resist dis-assembly of the body.
7. An electrical connector according to claim 6, characterised in that the members (11,23) comprise a pin or spigot (23) on one of the body parts arranged for engagement in a socket (12) in the other body part.
8. An electrical connector according to claim 6, characterised in that the spigot and socket connectors (12,23) are also used to locate the electrical conductors (7) in place in the body.
9. An electrical connector according to claim 8, characterised in that the electrical conductors (7) are formed with apertures (14) adapted to receive respective pins or spigots (23).

FIG. 1

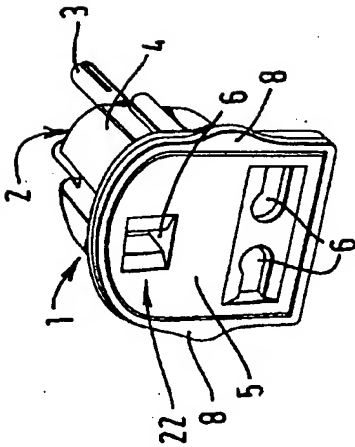


FIG. 2

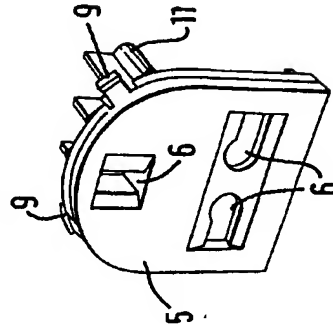


FIG. 4

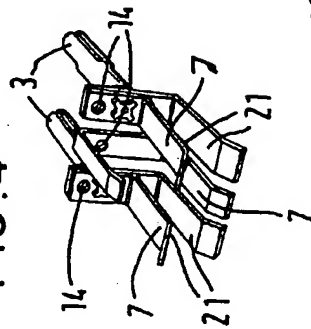


FIG. 5

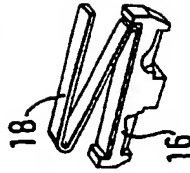


FIG. 3

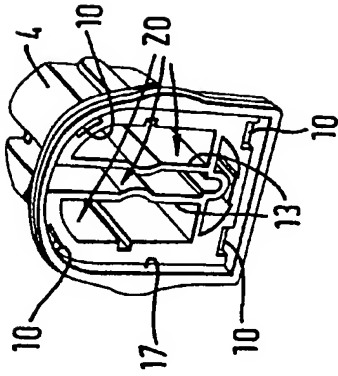


FIG. 6

